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FEMA

February 16, 2005

Samuel Collins, Regional Administrator
Nuclear Regulatory Commission, Region I
475 Allendale Road
King of Prussia, PA 19406

Dear Mr. Collins:

In compliance with NUREG-0654, FEMA REP-1, Rev. 1 and FEMA Guidance Memorandum (MS-1), Region I staff evaluated a Medical Support MS-1 Drill involving offsite response to a simulated contaminated, injured individual. Ambulance transport and treatment of the individual were evaluated.

Enclosed are three copies of the final report for the February 8, 2005, MS-1 Drill of the offsite radiological emergency plans for Pilgrim Nuclear Power Station in Plymouth, Massachusetts. This report addresses the evaluation of the plans and preparedness for the Commonwealth of Massachusetts, Quincy Medical Center, Quincy, Massachusetts and Fallon Ambulance Service. The final exercise report was prepared by Federal Emergency Management Agency Region I staff.

A copy of this report will be forwarded to NRC and FEMA Headquarters.

No new Deficiencies or Areas Requiring Corrective Action (ARCA) were identified during the February 8, 2005, drill. Two previous ARCAs were corrected as a result of the successful demonstration by the drill participants.

If you have any questions, please contact Jim Gibbons, Technological Hazards Specialist at (617) 956-7569.

Sincerely,

A handwritten signature in black ink, appearing to read "Deborah S. Bell".

Deborah S. Bell, Chair
Regional Assistance Committee

Enclosure



FEMIA

Pilgrim Nuclear Power Station

Commonwealth of Massachusetts, MS-1 Drill,

Quincy Medical Center, Quincy, Massachusetts

Licensee: **Entergy Nuclear Generation Company**

Exercise Date: **February 8, 2005**

Report Date: **February 14, 2005**

**DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY
REGION I
99 High Street
Boston, Massachusetts 02110**

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I. EXECUTIVE SUMMARY

On February 8, 2005, a drill was conducted at Quincy Medical Center, in Quincy, Massachusetts by the Federal Emergency Management Agency (FEMA) Region I. The purpose of the drill was to assess the capability of Quincy Medical Center and Fallon Ambulance Company to respond to a radiological emergency at the Pilgrim Nuclear Power Station (NPS). This drill was held in accordance with FEMA's policies and guidance concerning the exercise of State and local radiological emergency response plans (RERP) and procedures.

FEMA wishes to acknowledge the efforts of the many individuals in the Fallon Ambulance Company, the Quincy Medical Center Emergency Room and support staffs who participated in this drill.

The drill participants were proficient in performing the unique procedures required of this kind of situation. This is commendable in light of the fact that these skills were acquired for the most part through training and drills.

This report contains the final evaluation of the MS-1 Drill.

The Fallon Ambulance Company Emergency Medical Technicians (EMT), and Quincy Medical Center Staff demonstrated knowledge of their emergency response plans and procedures and adequately implemented them.

II. INTRODUCTION

On December 7, 1979, the President directed FEMA to assume the lead responsibility for all offsite nuclear planning and response. FEMA's activities are conducted pursuant to 44 Code of Federal Regulations (CFR) Parts 350, 351 and 352. These regulations are a key element in the Radiological Emergency Preparedness (REP) Program that was established following the Three Mile Island Nuclear Station accident in March 1979.

FEMA Rule 44 CFR 350 establishes the policies and procedures for FEMA's initial and continued approval of State and local governments' radiological emergency planning and preparedness for commercial nuclear power plants. This approval is contingent, in part, on State and local government participation in joint exercises with licensees.

FEMA's responsibilities in radiological emergency planning for fixed nuclear facilities include the following:

- Taking the lead in offsite emergency planning and in the review and evaluation of RERPs and procedures developed by State and local governments;
- Determining whether such plans and procedures can be implemented on the basis of observation and evaluation of exercises of the plans and procedures conducted by State and local governments;
- Responding to requests by the U.S. Nuclear Regulatory Commission (NRC) pursuant to the Memorandum of Understanding between the NRC and FEMA dated June 17, 1993 (Federal Register, Vol. 58, No. 176, September 14, 1993); and
- Coordinating the activities of Federal agencies with responsibilities in the radiological emergency planning process:
 - U.S. Department of Commerce,
 - U.S. Nuclear Regulatory Commission,
 - U.S. Environmental Protection Agency,
 - U.S. Department of Energy,
 - U.S. Department of Health and Human Services,
 - U.S. Department of Transportation,
 - U.S. Department of Agriculture,
 - U.S. Department of the Interior, and
 - U.S. Food and Drug Administration.

Representatives of these agencies serve on the FEMA Region I Regional Assistance Committee (RAC).

Formal submission of the RERPs for the Pilgrim Nuclear Power Station (NPS) to FEMA Region I by the State of Massachusetts and involved local jurisdictions occurred on June 16, 1981. Formal approval of the RERP was granted by FEMA on March 3, 1982, under 44 CFR 350.

A MS-1 Drill was conducted on February 8, 2005, by FEMA Region I, to assess the capabilities of the staff of the Fallon Ambulance Company and Quincy Medical Center in implementing their RERPs and procedures to protect the public health and safety during a radiological emergency involving the Pilgrim NPS. The purpose of this drill report is to present the drill results and findings on the performance of the offsite response organizations (ORO) during a simulated radiological emergency.

The findings presented in this report are based on the evaluations of the Federal evaluator team, with final determinations made by the FEMA Region I RAC Chairperson, and approved by the Regional Director.

The criteria utilized in the FEMA evaluation process are contained in:

- NUREG-0654/FEMA-REP-1, Rev. 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," November 1980;
- "Radiological Emergency Preparedness Exercise Evaluation Methodology", published in the Federal Register on September 12, 2001, and revised April 25, 2002.

Section III of this report, entitled "Drill Evaluation and Results," presents detailed information on the demonstration of applicable evaluation criteria at each jurisdiction or functional entity evaluated in a jurisdiction / based, issue only format. This section also contains (1) descriptions of all Deficiencies and ARCAs assessed during this exercise, recommended corrective actions, and the State and local governments' schedule of corrective actions for each identified exercise issue and (2) descriptions of unresolved ARCAs assessed during previous exercises and the status of the OROs' efforts to resolve them.

III. DRILL EVALUATION AND RESULTS

Participating Agencies: Fallon Ambulance Company, Quincy Medical Center

Contained in this section are the results and findings of the evaluation of the Fallon Ambulance Company and the Quincy Medical Center that participated in the February 8, 2005, MS-1 Drill to test the medical services capabilities to respond to an incident involving the Pilgrim (NPS).

Evaluation Area 6: Support Operations/Facilities

Sub-element 6.d. Transportation and treatment of contaminated injured individuals

Criterion 6.d.1: The facility has the appropriate space, adequate resources, and trained personnel to provide transport, monitoring decontamination, and medical services to contaminated injured individuals. (NUREG-0654, F.2; H.10; K.5.a; b; L.1; 4.)

The staff of the Fallon Ambulance Company and Quincy Medical Center adequately demonstrated this criterion.

The following is a status of the criterion evaluated.

1. Fallon Ambulance Company, Quincy, MA.

The Fallon ambulance crew, consisting of two Emergency Medical Technicians (EMT), was enthusiastic and highly knowledgeable. They exhibited good teamwork and attention to detail. Radiological monitoring of the simulated contaminated patient, was deferred to the hospital. The EMTs, informed of the potential for contamination, were careful to treat all parts of the patient as being contaminated. The attending EMT demonstrated excellent patient care, and contamination controls while treating the patient during the trip to the hospital. The ambulance driver kept the medical center informed of the patient's condition. Upon arrival at the medical center, the EMT immediately reported the medical condition and vitals to the Radiological Emergency Area (REA) medical staff and transferred the patient to the hospital. Then the EMTs were monitored by the hospital Radiation Safety Officer (RSO) using a Ludlem 14C survey meter (next calibration May 2005) with a pancake probe. The RSO was informed via controller interject of contaminated areas on the EMTs. The RSO guided the EMTs in the removal of the contaminated clothing and they were successfully decontaminated. The RSO then monitored the ambulance and through an interview explained how contaminated areas would be decontaminated. The RSO held the probe the correct distance from the surfaces being monitored and moved the probe at the recommended speed for the type of probe used. This proper demonstration of monitoring techniques corrects ARCA 48-02-6d.1-A-08. All activities were carried out in accordance with Quincy Medical Center's Plans and Procedures.

- a. **MET:** Criterion 6.d.1
- b. **DEFICIENCY:** None

c. AREA REQUIRING CORRECTIVE ACTIONS: 48-02-6.d.1-A-08

CONDITION: The outside RSO did not adequately demonstrate monitoring techniques using the CDV 700. While monitoring the ambulance crew and ambulance, the outside RSO held the probe further than an inch away and moved faster than a ½ inch per second.

POSSIBLE CAUSE: Not properly trained on the use of the CDV 700.

REFERENCE: NUREG- 0654,F.2, H.10, K.5a.b., L.1, 4.

EFFECT: Hospital or ambulance staff could have been contaminated and not known, thereby spreading contamination to the public.

RECOMMENDATION: Provide additional CDV 700 monitoring training to the RSO.

CORRECTIVE ACTION DEMONSTRATED: The RSO used a Ludlem 14C survey meter with pancake probe to monitor the ambulance crew and ambulance. The RSO held the probe at the prescribed distance from the surfaces being surveyed and moved it at the proper speed along the surfaces.

d. NOT DEMONSTRATED: None

e. PRIOR ARCAs – RESOLVED: None

f. PRIOR ARCAs – UNRESOLVED: None

2. Quincy Medical Center, Quincy, MA.

At the same time that the Emergency Department (ED) doctor was informed by the ambulance EMT that a possible radioactive contaminated patient was coming to the medical center; a Code Magenta was broadcast over the public address system. This prompted the medical center Environmental Services and Maintenance staff to prepare the ambulance entrance and Radiological Emergency Area (REA) with floor coverings, barriers, waste baskets, and step off pads. Additionally, a de-gowning procedure was posted in the REA. At the same time the Emergency Department (ED) doctor received a call from the on-scene Ambulance service informing him of the patient's injuries, vital signs, and the ambulance estimated time of arrival. The ED doctor briefed his staff on the situation and instructed them to prepare the REA.

In accordance to the plan, there were two Radiological Safety Officers (RSOs). They inventoried (including zeroing 0-200mR DRDs) monitoring equipment and distributed to REA staff. There were CDV 700s available (maintained by MDPH). The CDV 700 provided by MDPH were packed on 11/22/04 due for calibration 10/13/05. However, the RSO used the hospital's equipment (Geiger counter Ludlem 14C model, serial no. 188322 calibration due date: May 2005). This is in accordance to the plan as it states, 'the use of CDV 700 or equivalent'. The TLDs (dated 10/01/04) were distributed to REA staff.

The RSOs worked together to distribute the 0-200mR DRDs and TLDs to REA staff. The RSO provided instructions and completed Quincy Medical Plan Attachment six (6), 'Dosimetry Issue Record' form to record the REA staff name, date of issue, date returned, TLD #, 0-200 mR serial # and DRD readings. Throughout the demonstration, the RSO read and recorded DRD information. Per the plan, one RSO was in the buffer zone and the other was in the REA to provide monitoring assistance.

When the contaminated individual arrived, she was taken into the REA for initial medical analysis and decontamination. The RSO monitored the area to determine where to decontaminate. The REA staff removed the patient's clothing (rolled outward) and shoes; they were placed in the radioactive materials waste basket.

The doctor and the REA nurses worked to decontaminate her arm. They wiped the area with clean gauze several times and changed the 'chuck' each time. The buffer zone nurse provided an order to take swab samples of the patient's nostril, ear and mouth. Samples were labeled and put into the decontamination kit where they would be later removed by staff for analysis.

Through interview, the doctor stated that if an X-Ray was deemed necessary, he would have one brought into the REA. Contamination control measures would be used to ensure contamination of the X-Ray machine did not occur.

Through interview with the Maintenance staff, it was determined the hospital had the ability to turn off all air ventilation systems if necessary. Additionally, the REA would be restored to its pre-event status and he would contact appropriate representatives to handle the radioactive waste.

The REA staff and RSOs demonstrated their knowledge, expertise, and abilities to work as a team. They were able to prevent cross contamination and still provide necessary medical treatment. The REA staff and RSOs dressed out in protective clothing which included gloves, face masks, booties, and a protective apron, rather than the previous full protective suit with hoods. The light weight apron provided adequate protection and ventilation to prevent excess heat build up. This corrected ARCA 48-02-6d.1-A-09 in which the REA staff's use of full protective suits lead to heat stress. All activities were carried out in accordance with Quincy Medical Center's Plans and Procedures.

- a. **MET:** Criterion 6.d.1
- b. **DEFICIENCY:** None
- c. **AREAS REQUIRING CORRECTIVE ACTIONS:** None
- d. **NOT DEMONSTRATED:** None

e. PRIOR ARCAs – RESOLVED: 48-02-6d.1-A-09

CONDITION: The REA staff were experiencing heat stress, with the attending RSO displaying the most affects in the performance of his tasks.

POSSIBLE CAUSE: The full body protective suits are not ventilated.

REFERENCE: NUREG- 0654,F.2, H.10, K.5a.b., L.1, 4.

EFFECT: The reduced efficiency as a result of the heat stress caused by protective suits delayed the decontamination procedure and could cause health issues for the staff. The RSO was showing difficulty in maintaining the survey probe at the proper distance and speed during monitoring of the patient.

RECOMMENDATION: Use protective clothing that does not create excessive heat for the REA workers.

CORRECTIVE ACTIONS DEMONSTRATED: Protective aprons were used, replacing full body protective suits. The staff did not show signs of heat stress and correctly followed procedures.

f. PRIOR ARCAs – UNRESOLVED: None

APPENDIX 1.

DRILL EVALUATORS

The following is a list of the personnel who evaluated the Medical Services Drill (MS-1 Drill) for the Pilgrim NPS on February 8, 2005.

<u>EVALUATION SITE</u>	<u>CRITERION</u>	<u>EVALUATOR</u>	<u>ORGANIZATION</u>
Fallon Ambulance Company	Criterion 6.d.1	James Gibbons	FEMA Region I
Quincy Medical Center	Criterion 6.d.1	Lauren DeMarco	FEMA Region I

APPENDIX 2

EXTENT-OF-PLAY AGREEMENT Quincy Medical Center EVALUATION CRITERIA MS-1 DRILL February 8, 2005

1. PURPOSE

To evaluate the emergency response capabilities of the Pilgrim Nuclear Power Station (PNPS) organization, the Fallon Ambulance Company, and the Quincy Medical Center response to a radiological contaminated injured individual. This also met the annual requirement for a Pilgrim NPS Emergency Plan Medical Service (MS-1 Drill) with the Quincy Medical Center.

2. EVALUATION AREA 6: Support Operations/Facilities

Sub-element 6.d. Transportation and treatment of contaminated injured individuals

Criterion 6.d.1: The facility has the appropriate space, adequate resources, and trained personnel to provide transport, monitoring decontamination, and medical services to contaminated injured individuals. (NUREG-0654, F.2; H.10; K.5.a; b; L.1; 4.)

Extent-of-play-General Transportation

- Demonstrate control of the spread of contamination from individuals who may be contaminated and injured.
- Address priorities of care between control of contamination and the need for prompt transportation to a medical facility for care of an urgent condition.
- Transportation to a medical facility equipped to deal with a contaminated injured individual.
- Communications with the medical facility by the vehicle crew while in route.
- Monitoring of emergency vehicle and determination of the need for decontamination.
- Demonstrate adequacy of plans and procedures for the care and transportation of contaminated or exposed individuals.

Extent-of-play – Specific Transportation

- Demonstrate the ability of the Ambulance Service personnel to respond to a request for assistance and to:
- Don protective clothing as necessary.
- Obtain information on the patient's condition.
- Prepare the patient for transfer to the medical center.
- Prepare the ambulance for receiving a radiological contaminated patient.
- Transfer the patient to the medical center.
- Brief the receiving medical center on the patient's condition via ambulance radio.

Extent-of-play – General Treatment

- Demonstrate the ability to control the spread of contamination from individuals who may be contaminated and injured.
- Demonstrate the setting priorities between the need to address radioactive contamination and the prompt diagnosis and treatment of medical conditions.
- Demonstrate the appropriate decontamination of individuals.

Extent-of-Play – Specific Treatment

- Demonstrate the ability of the Medical center staff to respond in accordance with the Medical center's MS-1 Medical center Plan:
- Receive communications from the ambulance.
- Set up the REA and establish a radiological controlled area.
- Treat the patient's injuries.
- Decontaminate the patient prior to release from the REA.
- Demonstrate the ability of the Medical Center Radiological Safety Officer to:
- Assist in radiological control at the medical center.
- Collect and maintain control of all contaminated materials for decontamination and disposal.
- Perform surveys of the ambulance and ambulance crew prior to release.

APPENDIX 3

EXERCISE SCENARIO

This appendix contains a summary of the simulated sequence of events -- Exercise Scenario -- which was used as the basis for invoking emergency response actions by OROs in the Pilgrim Nuclear Power Station (NPS) MS-1 Medical Drill held on February 8, 2005. This exercise scenario was submitted by the State of Massachusetts and Entergy Nuclear Generation Company and approved by FEMA Region 1 on December 21, 2004.

SCENARIO NARRATIVE

A radiological event is in progress at Pilgrim Nuclear Power Station resulting in a General Emergency declaration at the site due to a release of radioactive materials exceeding Protective Action Guide limits. Portions of the Emergency Planning Zone around Pilgrim Station have been ordered to evacuate. A minivan carrying an assisted-living resident from an elderly residence complex has evacuated the area and was en route through this area.

A motor vehicle accident involving this minivan has occurred several blocks from Quincy Medical Center. The weather outside is cold, with intermittent rain and fog. The driver of the minivan lost control of the vehicle while at slow speed and ran sideways into a telephone pole. The elderly evacuee in the minivan has sustained lacerations to the right arm, with possible fracture. The driver of the minivan has sustained only minor injuries.

EMS has responded to the scene and stabilized and prepared the injured evacuee for transport to Quincy Medical Center. The patient has received a laceration on the right arm with a potential fracture. While on-scene, the ambulance crew discussed the event with the minivan driver, who confirmed that they had originated their trip from the area surrounding Pilgrim Station as a result of an order to evacuate this area.

All of the above actions will be simulated. This drill does not involve any on-scene fire or police service activities. All such activities will be simulated or performed by controllers. The drill begins for Quincy Medical Center with the call from the ambulance/dispatcher to the hospital indicating that the ambulance will be bringing a potentially contaminated and injured individual to the hospital. Normal radio communications from the ambulance/dispatcher to the hospital will be established and maintained during the period that the patient is in transit from the simulated accident scene to the hospital.

The injured patient remains alert during transport to the hospital. Upon arrival at the hospital, the patient is transferred to the Radiation Emergency Area (REA) for evaluation and treatment.

A hospital Radiation Health Personnel should assist the Emergency Department (ED) Staff in radiation monitoring and contamination control as needed. If done properly, the first decontamination attempt will reduce the contamination to "as found". The attending physician will conduct a complete physical exam and may request an x-ray of the right arm. Once the Patient is decontaminated and removed from the REA, the staff will exit the REA and the exercise will terminate. A critique will be held immediately following the exercise.